

Dog Flu Vaccine

A live-attenuated vaccine for canine influenza virus.

Problem Solved by This Technology

Canine influenza virus (CIV) is a recently emerged virus that causes acute respiratory disease in dogs. Most dogs have no immunity to CIV, and infection may therefore spread quickly in locations with concentrated dog populations such as boarding kennels, doggy day cares, and animal shelters. Currently, there is only one approved vaccine that reduces the severity and incidence of canine influenza, and that vaccine is based on an inactivated virus.

Live-attenuated influenza vaccine (LAIV) is known to provide better protection against disease through the induction of better innate and adaptive immune responses.

To date, no LAIV for CIV infections has been developed. Researchers at the University of Rochester have developed a CIV LAIV based on mutations in the viral polymerase that confer the virus temperature sensitivity, like that of the human LAIV.

Applications

Dr. Luis Martinez-Sobrido and his team have shown that introduction of mutations in the viral polymerase make the CIV temperature sensitive (e.g. able to replicate at low, but not high, temperatures). In addition, using an animal model of influenza virus infection, they have obtained preliminary data demonstrating that the CIV LAIV does not replicate in the lungs of infected animals. Moreover, immunogenicity data from these experiments demonstrate that the induction of both total and neutralizing antibody responses against CIV is better than that observed with the currently available inactivated vaccine.

Significantly, the data show that a single intranasal immunization confers complete protection against challenge with wild-type CIV and that this protection is better than that observed with the CIV inactivated vaccine. Hence, this intranasal competitive LAIV could be used to provide a better protection against CIV in dogs than that currently obtained with the inactivated CIV vaccine. Moreover, this novel vaccine confers protection against the new H3N2 CIV that has been recently introduced in the USA and is spreading widely in the mid-Western states.

URV Reference Number
6-15135 & 6-15136



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Publication

"Development of a mouse- adapted live attenuated influenza virus that permits in vivo analysis of enhancements to the safety of live attenuated influenza virus vaccine." Cox A, Baker SF, Nogales A, Martínez-Sobrido L, Dewhurst S. J Virol. 2015 Mar;89(6):3421-6. Doi: 10.1128/JVI.02636-14. PMID: 25552727.

Technology Status

Proof of Concept has been validated *in-vivo*.

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